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NEEDS ASSESSMENT OF SWEET POTATO PRODUCTION IN NORTHERN GHANA: IMPLICATIONS FOR RESEARCH AND EXTENSION EFFORTS

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ABSTRACT

The study was carried out to generate baseline information on production, marketing and utilization of sweet potato in Northern Ghana. The assessment was carried out using Rapid Rural Appraisal tools, including focus group discussions, key informant interviews, seasonal calendars, problem solving tree, decision making matrix, problem census and prioritization matrix. Northern and Upper East Regions reported higher yields ranging from (3 - 3.6) tons/acre of fresh sweet potato if fertilizer was applied. Upper West had lower yields of about (1.4 -1.8) tons/acre of fresh sweet potato (No fertilizer applied). Northern and Upper East Regions also had a benefit-cost ratio of 2.5 compared with that of the Upper West Region of 2.05. Lack of planting material was a major limiting factor to the expansion of sweet potato production especially in Northern and Upper West Regions. Lack of good market sources was an important limiting factor to production in all regions. 5 varieties were identified in upper east region with 3 and 4 identified in Northern and Upper West Regions, respectively. This was mainly based on flesh and skin colour of the sweet potato, with orange-fleshed sweet potato being well-known at each location.

Keywords: sweet potato, orange-fleshed, needs assessment.

INTRODUCTION

With more than 133 million tons (FAOSTAT, 1998) in annual production sweet potato ranks the most important crop in fresh weight basis in developing countries after rice, wheat, maize and cassava. In Ghana, annual production is 90,000 tons from an area of 65,000 ha (FAOSTAT, 2006). A recent study by CORAF/IFPRI (2006) indicated that roots and tubers contribute the most to agricultural growth in West and Central Africa and the most to Ghana's agricultural growth as well. Current information available from Ghana's CSIR-CRI shows that roots and tubers account for approximately 40% of Ghana's GDP whilst cereals account for 7%. Ghana is not providing the necessary production support services to the crop to harness its huge potential for food security and poverty reduction (Sam and Dapaah, 2009). A major source of concern in sweet potato production is storage, Marketing and utilization. The tubers are sold within two-four weeks after harvest. The production status per region of Ghana and their relative contribution to national production is shown in Table-1 below. As part of activities to promote the production, marketing and utilization of sweet potato in general and more specifically the orange flesh sweet potato by International Potato Center (CIP) Ghana, a sweet potato community need assessment was carried out to generate relevant information to describe the prevailing sweet potato production, marketing and utilization in northern Ghana. The results of the community analysis was expected to guide CIP Ghana to identify entry points and to help in the design of interventions for implementation in the selected districts of the three northern regions and also serve as a data base (reference point/measuring scale) against which progress can be measured.

Table-1. Sweet potato production in Ghana (2012).

Region	**Area** (Ha)	**% Contribution**	**Production** (Mt)	**% Contribution**
Central	371	3.9	6,490	4.9
Volta	880	9.1	15,340	11.6
Eastern	1,030	10.7	34,910	26.4
Gt. Accra	38	0.4	640	0.5
Ashanti	37	0.4	620	0.5
Brong Ahafo	145	1.5	2,390	1.8
Northern	414	4.3	6,070	4.6
Upper East	5,550	57.7	46,000	34.9
Upper West	1,157	12.0	19,530	14.8
Total	9,622	100.0	131,990	100.0

Source: MoFA Field survey, 2012

MATERIALS AND METHODS

The sweet potato farmer's needs assessment was carried out using qualitative Rapid Rural Appraisal (RRA) tools developed by Robert Chambers, which included focus group discussions (FGDs), key informants interviews, seasonal calendars, problem solving tree, decision making matrix, problem census and prioritization matrix, and personal field observation. This was aimed at gathering information on the production, marketing and processing and utilization.

Besides that some secondary data was obtained through desktop research of literature on existing studies already done on similar subject. Focus group discussions were carried out with randomly selected farmers within the project districts. This was guided by a pre-printed checklist designed to meet the information needs of this assignment. Key informants interviews were conducted, basically engaging in a conversation with key stakeholders in the district such us district MoFA monitoring and evaluation officers and the crops officers.

The proposed sampling strategy used included zoning by region, purposive sampling, randomization, and stratification. Within the Northern sector of Ghana, three regional zones were created to represent the different climatic areas. This included the northern region (Guinea Savanna), the upper east region (Sudan Savanna) and the upper west region (Guinea Savanna). Two communities were purposively selected within each region, giving us six communities in all. Sites in Upper West and Northern Regions were chosen to coincide with benchmark sites for a multi-partner CGIAR systems research and development program. Farmers were also selected because of their involvement and commitment to sweet potato production. Out of the selected communities, some sweetpotato farmers were randomly selected to take part in the study. The selection of farmers was stratified to give representation to both male and female farmers. In all about 212 farmers took part in the survey.

RESULTS, ANALYSES AND DISCUSSIONS

The results from the Rapid Rural Appraisal are presented here. This covered all the six communities in the three regions.

Variety preference

Table-2. Three dominant varieties identified.

Variety	Skin colour	Flesh colour
V1	Orange	Orange
V2	White	White
V3	Purple	White

Source: CIP Ghana Field survey, 2012

Table-3. Varietal preferences analysis at Dimabi site.

Characteristics	V1	V2	V3	Comments
Taste/consumption				Variety V3 is most preferred for eating
Sweetness				V1 is the sweetest
Yield potential				V1 has the highest yield potential
Prone to Pest/diseases				V3 is more resistant to pest and diseases attack compared to the other varieties
Fibrous				V2 has high fiber content
Market demand				V3 has high demand
Market value				V3 has high market value
Processing				V2 is easy to process into potato powder for porridge and as sweetener
Dry matter content				V3 is high in DMC
Sum of Scores	16	19	15	
Preference	3rd	2nd	1st	

Scores Key: 1 2 3

Source: CIP Ghana Field survey, 2012

There were three major varieties that were found across all three regions and described in Table-2 above. These were ranked from the most important to the least important (1, 2, and 3) with respect to the following attributes; Taste/consumption, Sweetness, Yield potential, Resistance to Pest/ diseases attack, Fibrous nature, Market Demand, Market value, Dry matter content and ease of processing. The rankings are then summed up and the variety with the least sum of score is the most preferred and the one with the highest sum of scores is the least preferred. These rankings were done in all six communities. The analysis in Dimabi is shown in Table-3 above and the summary from all community analysis is provided in Table-4 below.

Table-4. Farmer variety preference results summary.

Variety	Skin colour	Flesh colour	Preference					
			NR		UER		UWR	
			Dimabi	Cheyohi	Nikongo	Kpaliga	Touri	Dikpe
V1	Orange	Orange	3rd	2nd	1st	3rd	1st	1st
V2	White	White	2nd	3rd	3rd	2nd	2nd	2nd
V3	Purple	White	1st	1st	2nd	1st	3rd	3rd

From Table-4 above, in northern region all the two communities ranked the purple white variety as the most preferred. However Dimabi community ranked white variety second and the orange orange variety as the least preferred. Cheyohi however ranked orange orange as second and white as the least preferred.

In the upper east region, Nikongo ranked orange orange variety as the most important, followed by purple white and then white white variety. In Kpaliga purple white was most preferred, followed by white white and then orange orange. For the upper west, the two communities were consistent and ranked orange orange as the most preferred, then white as the second and then purple white as the least preferred.

Table-5. Seasonal calendar.

Month / Activity/Item[1]	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Rainfall			*	***	****	****	*****	*****	*****	**		
Drought (shortage of water)	*****	*****	***								**	*****
Floods								*****	*****			
Crop sequence[2]												
• Millet				LP	P	P/W	W	W/H	W	W	H	
• Sorghum				LP	P	P/W	W	W	W	W	H	
• Maize				LP	LP	P	P	W	W	H	H	
• Rice					LP	P	P	W	W	H	H	
• Soya				LP	LP	P	P	W	W	W	H	H
• Potato NR				LP, MM	MM	P,W	W,FA	W,FA	W	H*	H**	H
• Potato UWR					LP,MM	P,W	W,FA	W,FA	H**	H***	H*	
• Sweet Potato UER					LP, MM	P,W	W,FA	W,FA	W	H*	H***	H
Availability of fruits												
• Shea	*	*	*	*	***	****	*****	*****	**	*	*	*
• Mango	*	**	***	*****	****	***	*	*	***	*	*	*
Availability of vegetables	***	***	****	****	****	*****	*****	*****	*****	****	***	**
Food shortages	*	*	*	**	***	****	*****	*	*	*	*	*
Employment	***	***	***	*	***	****	*****	*****	***	**	**	*
Unemployment	***	***	***	****	***	**	**	*	**	***	***	****
Out-migration	**	**	***	*****	**	*	*	*	*	*	**	***
Non-farm income generating activities												
• Rearing	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
Labour peaks men	***	***	**	**	***	****	*****	*****	*****	*****	****	***
Labour peaks women	**	**	**	****	****	*****	*****	*****	*****	*****	*****	***
Social activities (funerals /weddings)	***	****	*****	*****	***	*	*	*	*	*	**	***
Expenses	**	**	*****	*****	***	***	***	****	**	**	***	**
Income	**	****	*****	***	*	*	**	*	*	***	****	****
Incidence of human diseases	**	***	****	*****	***	**	***	*****	*****	***	**	**

The three regions have similar sweet potato production calendars this is shown in the seasonal calendar in Table-5 above. Land preparation, planting, weeding and harvestings across all regions have similar calendar.

Table-6. Sweet potato problem solving tree.

Problem	Causes	Solutions/Coping strategies
Lack of planting materials	Stealing of preserved planting materials Lack of irrigation facilities to multiply during the dry season	Construction of community gardens to preserve planting materials Buying from neighboring communities Ratooning
Theft	It is sweet and can be eaten raw making it attractive to thieves	Fencing of fields and paying more attention to it
Weevils and Termites	Because of its sweetness it attracts termites and weevils Weeds infestation also induces weevils and termites attack Potato grown on loamy soils are prone to weevils and termites attack	They adopt shifting cultivation to control weevils and termites
Poor rainfall	Planting is mostly late due to lack of planting materials and when the rains stops early it affects yield	Early planting when planting materials are available
Poor market/prices	Glut due to harvesting at the same time Easy rot of potatoes (1-2 weeks) after harvest	Provide varieties with long shelve life and different maturity periods
Storage challenges	Short shelve life (1-2 wks)	Introduce improved varieties

Table-7. Sweet potato farm budget.

Region	Northern	Upper West	Upper East
Parameter			
Av. Farm size in acres	0.75	0.5	3
Yield in tons/acre	3.3	1.6	3.3
Price per ton GHS	227.27	253.13	227.27
Av. Revenue/acre GHS	750.00	405.00	750.00
Av. Cost of production/acre GHS	300.00	200.00	300.00
Gross margin GHS	450.00	205.00	450.00
Benefit cost ratio (B/C)	2.5	2.025	2.5
Number of varieties identified	3	4	5

From Table-7 above, northern and upper east regions reported higher yields with a mean yield of 3.3 tons of fresh sweet potato per acre of land cultivated. Upper West has the lowest yield of about 1.6 tons/acre of fresh sweet potato. The reason given for such low yields was non application of fertilizer. It is possible to increase yields from this area when fertilizer is applied.

The gross margins of Northern and Upper East are about 450.00 GHS compared to that of the Upper West Region with 205.00 GHS. Northern and Upper East Regions also have a benefit cost ratio of 2.5 compared with that of the Upper West Region of 2.05. It is economically feasible to increase cost by applying fertilizer and still increase your returns on investment. With regard to average sweet potato farm size per region, Upper East Region has the highest with average of about 5 acres followed by northern region with about 0.75 acres and then Upper West with an average of 0.50 acres.

Constrains to sweet potato production were identified across the three sites to include; lack of planting materials, stealing, weevils and termites attack, poor rainfall pattern, poor market prices, and poor storability of sweet potato. Reasons and coping strategies for this constrains were identified as shown in tale 6 above.

CONCLUSION AND RECOMMENDATION

The lack of sweet potato seed was mention as one of the major limiting factors to the expansion of their sweet potato farms especially Northern and Upper West Region. Though Upper East Region acknowledged this,

they however mention lack of sufficient farm implements to plough their fields to be their major limiting factor to increase production. All the regions recognize the lack of good market sources as an important limiting factor to production. They unanimously agreed that with the availability of good output market it will motivate them to expand production. Sweet potato production is mainly mono cropping across all the three regions.

About 5 varieties were identified in upper east region with 3 and 4 identified in Northern and Upper West Regions respectively. This was mainly based on flesh and skin colour of sweet potato.

It is economically feasible to increase cost by applying fertilizer and still increase returns on investment. General there are great potential for the development of sweet potato in these regions of the North if the concerns raised are addressed. The regions soil and climatic conditions support the growth of the sweet potato.

We also want to recommend that a detailed study should be done through household survey using structured questionnaires in order to provide more quantitative estimates on the production, post-harvest losses, processing and utilization of sweet potato in Northern Ghana.

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